

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Arvin Edison Water Storage District/Metropolitan Water District 2009-2010 Water Exchange Program

EA-09-97



**U.S. Department of the Interior
Bureau of Reclamation
Mid Pacific Region
South Central California Area Office
Fresno, California**

June 2009

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List of Acronyms, Abbreviations and Definition of Terms

AEWSD	Arvin-Edison Water Storage District
af	acre-feet (the volume of water one foot deep and an acre in area)
af/y	acre-feet per year
Aqueduct	California Aqueduct
CVC	Cross Valley Canal
CVP	Central Valley Project
CVPIA	Central Valley Improvement Act
CY	Contract Year
DSA	Direct Service Area
DWR	California Department of Water Resources
EA	Environmental Assessment
ESA	Endangered Species Act
FKC	Friant-Kern Canal
FWCA	Fish & Wildlife Coordination Act
FWS	U.S. Fish and Wildlife Service
IRP	Integrated Resources Plan
ITA	Indian Trust Asset
KCWA	Kern County Water Authority
MBTA	Migratory Bird Treaty Act
M&I	municipal and industrial
MP	milepost
MWD	Metropolitan Water District of Southern California
NHPA	National Historic Preservation Act
Reclamation	Bureau of Reclamation
SLR	San Luis Reservoir
SOD	South of the Delta
SWP	California State Water Project
SWRCB	State Water Resources Control Board
TOC	Total Organic Carbon

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Section 1 Purpose and Need for Action

1.1 Background

The State of California is currently experiencing unprecedented water management challenges during a very dry 2009 Contract Year (CY) (The 2009 Contract Year is March 1, 2009 through February 28, 2010). This year, both the State and Federal water projects are forecasting very low storage conditions in all major reservoirs.

In response to California's third consecutive year of drought, Governor Schwarzenegger proclaimed a state of emergency on February 27, 2009. In this proclamation, the Governor found that the drought conditions and water delivery limitations, identified in the 2008 Executive Order and Emergency Proclamation, still exist and have worsened in this third year of drought, creating emergency conditions throughout the State of California.

The State Water Project (SWP) has declared only 40 percent of their Table A supplies available to SWP contractors, resulting in a significant reduction in available water supplies to Metropolitan Water District (MWD). This has left MWD in a position of having to call upon its dry year reserves, in particular, their SWP supplies previously stored in the Arvin-Edison Water Storage District's (AEWSD) groundwater bank.

Additionally, with 2009 being a drought year, the Bureau of Reclamation (Reclamation) is interested in facilitating solutions to water management challenges that have arisen due to the water shortages. In this regard, Reclamation, in cooperation with the Department of Water Resources (DWR), has successfully petitioned the State Water Resources Control Board (SWRCB) to consolidate the Central Valley Project (CVP) and SWP places of use, including the water right permits for the Friant Division of the CVP, for a period of two years. This creates the opportunity, among other opportunities, for Friant Division water supplies to be exchanged with other supplies available and to potentially meet demands in the Southern California service areas of MWD. The proposed AEWSD/MWD exchange was specifically cited in the change petition that was submitted by Reclamation and DWR to the SWRCB earlier this year. This exchange is proposed to occur only within the timeframe specified for the consolidation for the CVP and SWP places of use, from approximately June 1, 2009 through May 31, 2010 and only to the extent MWD has water in storage in AEWSD.

The purpose of AEWSD, since it was formed in 1942, is to provide a reliable supply of good quality water for its landowners for agricultural purposes. In order to regulate a

highly variable water supply, AEWSO developed a water management program based on the concept of delivering imported water in years of above average water supplies to spreading ponds for groundwater recharge and extracting previously stored groundwater to meet agricultural demands when surface supplies are deficient. Historically, AEWSO has also used its facilities to accomplish water management goals and exchanges with other water agencies

In December 1997, AEWSO entered into a long-term Water Management Program with MWD (Program). In October 2008, AEWSO and MWD amended and restated the original agreement to encompass, among other things, mutually beneficial provisions as experienced over the first two years of the Program. Under Program, AEWSO agreed to bank MWD SWP supplies during years when MWD had SWP supplies which exceeded its service area demands and return said water in certain drought years when MWD needed additional water supplies to meet its service area demands similar to what AEWSO does for its own landowners. (see Figure 2 for Program Participants' Vicinity Map.)

The effects of the existing Program were analyzed under CEQA several years ago when the Program was initialized. These environmental documents associated with the Program is incorporated by reference into this Environmental Assessment (EA) (see Section 1.6).

1.2 Purpose and Need

DWR is predicting a dry year in 2009 for the SWP. With reservoirs levels at critically low levels this year and thus going into next year, the prospects of another low water year in 2010 are significantly increased. In addition, due to Federal Judge Oliver Wanger's Delta Smelt Interim Remedy Order, the recent Biological Opinion from the National Marine Fisheries Service on the Continued Long-term Operations of the CVP and SWP, and subsequently proposed operations of both the SWP and CVP, operation of the State and Federal pumping plants will be limited this year with likely significant limitations in CVP and SWP pumping anticipated for next year as well.

The proposed exchange would assist AEWSO in fulfillment of its obligation under the groundwater banking Program with MWD. As noted above, MWD has been placing their SWP supplies with AEWSO for storage in AEWSO's groundwater reservoir for many years. AEWSO has historically pumped the stored groundwater out and introduced the actual groundwater into the California Aqueduct (Aqueduct) for return to MWD in years in which MWD has requested. The current proposal would allow AEWSO to send some of their own CVP Friant water to MWD in lieu of AEWSO pumping groundwater. As a consequence, the groundwater that otherwise would have been pumped would be

exchanged in its ownership from being MWD's to AEWSD's, consistent with the terms of the Program, thus completing the exchange. This would save AEWSD/MWD the energy and cost associated with otherwise pumping and returning groundwater. If AEWSD is also directly recharging water to their groundwater at the time of exchange, it would also save AEWSD the expenses associated with operating their recharge basins. This proposed exchange is intended to allow the expeditious water delivery of surface water supplies available to AEWSD in lieu of groundwater it otherwise would have extracted and delivered to MWD in fulfilling its return water obligations to MWD under their Program of water banking this year and potentially next year. Water so delivered would primarily serve to reduce energy use with attendant cost savings and would allow MWD greater instantaneous access to water supplies to meet summertime peaking demands as well as provide greater operational flexibility to AEWSD.

Reclamation's purpose under the proposed action is to fulfill its role as Contracting Officer and approve water exchange requests.

1.3 Scope

The effects of the existing Program were analyzed when the Program was initialized.

The areas involved in the proposed exchange and thus potentially impacted by the exchange are the lands within the CVP service area boundary of AEWSD and the lands within the SWP service area boundary of MWD.

The proposed exchange would occur from June 2009 through May 2010 and therefore this will be the study period for evaluating the direct effects.

1.4 Potential Issues

Potentially affected resources in the project vicinity include:

- Surface Water Resources
- Land use
- Biological Resources
- Cultural Resources
- Indian Trust Assets
- Socioeconomic Resources
- Environmental Justice

1.5 Authorities for the Proposed Action

The exchange analyzed in this EA may be subject to the following contracting authorities and guidelines as amended and updated and/or superseded such as:

- Reclamation Reform Act, October 12, 1982
- Secretary of the Interior Ken Salazar and Agriculture Secretary Tom Vilsack recently announced the creation of a Federal Drought Action Team that will work cooperatively to respond to communities facing significant drought. The Drought Action Team will work with California's state drought response team to minimize the social, economic and environmental impacts of California's current drought. Importantly, Secretary Salazar directed Reclamation to work closely with State authorities to facilitate water transfers for the Drought Water Bank that is operated by the State. He also directed Reclamation to provide operational flexibility to convey and store water to facilitate additional transfers and exchanges that can move water to critical-need areas.

1.6 Related Environmental Documents

- Arvin-Edison Water Management Project Negative Declaration dated May 1996, and Addendum to the Negative Declaration for the Arvin-Edison Water Management Project dated December 2002, and the Arvin-Edison South Canal Improvement Project Negative Declaration dated November 2006.

Section 2 Alternatives Including the Proposed Action

2.1 No Action

Under the No Action Alternative, Reclamation would not approve the exchange of CVP water from AEWS (maximum of 80,000 acre-feet (af), 40,000 af per year (af/y)) to MWD between June 1, 2009 and May 31, 2010.

2.2 Proposed Action

Reclamation proposes to approve an exchange of CVP water to MWD of up to 80,000 af, (40,000 af/y) between June 1, 2009 and May 31, 2010. AEWS would allow up to 40,000 af/year of its 2009 CY and a similar amount in CY 2010 through May 31, 2010 Class 1 or Class 2 Friant Division CVP supplies to be delivered to MWD. As AEWS's CVP water supplies in excess to its needs and obligations become available, exchange volumes will be better defined. The exchanged CVP water will be delivered from Millerton Lake Reservoir at existing diversion points at Friant Dam into the Friant-Kern Canal (FKC). The water would be transported through the Friant-Kern Canal to Milepost 151.80, the AEWS Turnout. No other CVP facilities would be utilized in the delivery of the exchanged water. The water supplies will be exchanged within the AEWS canal system. The CVP water would then be transported through AEWS conveyance facilities to a point of introduction into the California Aqueduct at the AEWS California Aqueduct Turnout/Turnin while AEWS would take possession of previously banked MWD SWP water.

The proposed exchange is in furtherance of the existing Program. By virtue of the opportunity presented by the temporary consolidation of the SWP and CVP places of use, and importantly including the CVP Friant Division permits in this consolidation, AEWS can directly deliver some of its Friant Division CVP contract supplies to MWD instead of returning dry year payback obligations to MWD under the Program. As a consequence, the groundwater that otherwise would have been pumped and returned to MWD would be exchanged in its ownership from being MWD's to AEWS's. AEWS would be returning pumped groundwater to MWD and at the same time would spread Class 2 water in its recharge basins (if available).

The Program has been in operation for several years and its monitoring of water quality delivered to the Aqueduct is well established. Delivery of surface water in-lieu of or

melded with pumped groundwater would follow the same protocols (See Appendix A for the water quality monitoring protocols.)

Pursuant to the Aqueduct's Pump-in Facilitation Group guidelines, during pump-in of the existing banking Program operations, AEWS D submits on a weekly basis a blending model that reflects the estimated water quality which includes several constituents of concern (Arsenic, Bromide, Total Organic Carbon (TOC), Chromium, Chromium, Nitrate, total dissolved solids, Sulfate and Uranium) as water travels through AEWS D conveyance system and subsequent discharge into the Aqueduct. AEWS D may be receiving water from numerous sources simultaneously, including in-district groundwater. The blending model considers recent Title 22 testing (within 3 years) and constituents of concern (once a year) of each source and the model is validated (once a month) with actual field measurements prior to the discharge. This monitoring program can be reviewed in its entirety as it is submitted yearly prior to pump-in to the Kern County Water Agency who acts on behalf of all Kern County-wide Aqueduct pump-ins.

The proposed exchange will be a "bucket for bucket" exchange. MWD will exchange an equivalent amount of banked groundwater in the AEWS D-MWD Banking Program for the delivered CVP supplies. The SWP water, so exchanged, will reside in AEWS D's groundwater reservoir for ultimate delivery by AEWS D for agricultural purposes. At a time of its choosing, AEWS D will use district-owned groundwater wells to recover the banked water and deliver it to AEWS D landowners.

Through this exchange the responsibilities and limitations of Reclamation Law (Reclamation Project Act of 1939 and Reclamation Reform Act of 1982) will become associated with MWD's SWP water currently stored in the AEWS D-MWD groundwater bank and which AEWS D will take possession of as a result of the exchange.

MWD would use the exchanged CVP water for municipal, industrial and drinking water purposes within their service area.

No native or untilled land (fallow and untilled for three years or more) may be cultivated with CVP water involved in these actions.

No new construction or modification of existing facilities is to occur in order to complete the Proposed Action.

Transfers and exchanges involving CVP water cannot alter the flow regime of natural waterways or natural watercourses such as rivers, streams, creeks, ponds, pools, wetlands, etc., so as to have a detrimental effect on fish or wildlife or their habitats.

All transfers and exchanges involving CVP water must comply with all applicable federal, state and local laws, regulations, permits, guidelines and policies.

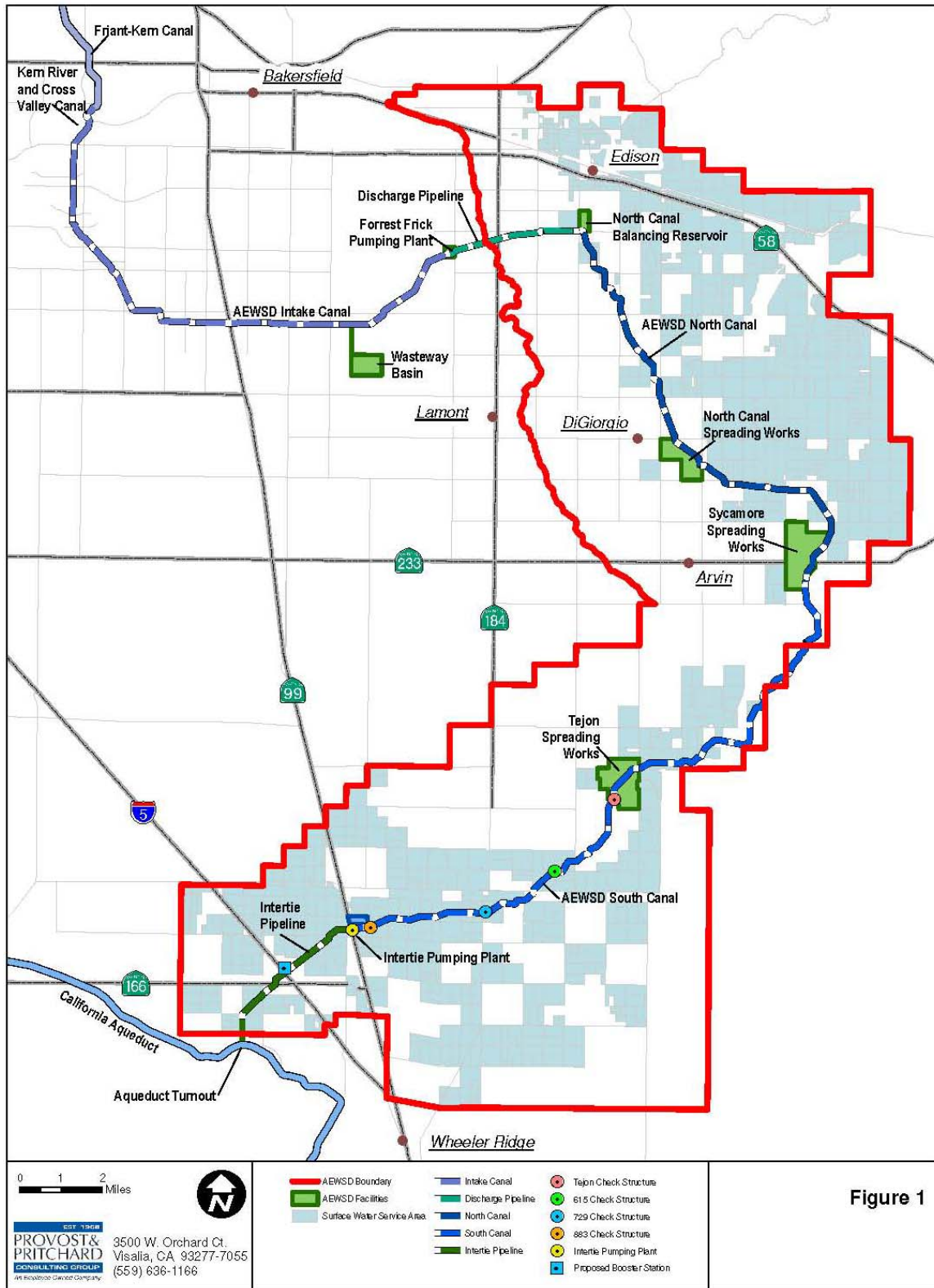


Figure 1

Figure 1 AEWSD District Facilities Map



Figure 2

Figure 2 AEWSD-MWD Banking Program Participants Map.

Section 3 Affected Environment and Environmental Consequences

3.1 Water Resources

3.1.1 Affected Environment

Drought Emergency

In response to California's third consecutive year of drought, Governor Schwarzenegger proclaimed a state of emergency on February 27, 2009. In the proclamation, the Governor found that the drought conditions and water delivery limitations identified in last year's Executive Order and Emergency Proclamation still exist, and have worsened in this third year of drought, creating emergency conditions throughout the State of California.

The Governor's Proclamation highlights the fact that 2009 has the potential to be one of the most severe drought years in California's recorded history. Water supplies in major reservoirs and many groundwater basins are already well below average. The three-year cumulative water deficit is so large there is only a 15 percent chance that California will replenish its water supply this year. California's water supply system is less able to provide adequate drought year supplies than in previous multi-year drought periods. The recent biological opinion for the protection of Delta smelt issued December 15, 2008 has reduced the flexibility of the SWP and CVP operations throughout the year, substantially limiting the Projects' ability to store and export natural flow during the winter and spring periods in dry years. Since the last significant dry drought period, California has experienced a substantial increase in the planting of permanent, high-value crops that cannot be fallowed on an annual basis in response to fluctuating water supplies. In addition, California's population is growing rapidly, but the statewide water system has not kept pace.

To combat the dire conditions, the Governor ordered immediate action to manage the crisis. The Governor's Proclamation directs state agencies to implement a range of activities intended to prevent, remedy or mitigate the effects of the extreme drought emergency. Importantly, the proclamation directs DWR to, among other things, facilitate and expedite water transfers and related efforts by water users and suppliers and to work with the Federal Drought Action Team to coordinate federal and state drought response activities.

MWD and AEWS D 2009 Contract Allocations

The ten-year average allocation of SWP water supplies delivered to the water contractors is described in Table 1. It lists maximum deliveries of SWP water on a yearly basis from 1999 to 2009. The ten-year average is 68 percent of Table A contract amounts. The annual Table A contract amount for MWD is 1,911,500 af, thus the average SWP supply to MWD has been 1,298,000 af. With a 2009 allocation of 40 percent (764,600 af) MWD is 533,400 af below the typical supply levels. Thus, MWD needs to call upon their banked water resources including the water they have banked with AEWS D under the Program.

Table 1 Average SWP Table A Allocation (as Percentage of Contract Amounts)

Contract Year	Allocation (%)
2009	40
2008	35
2007	60
2006	100
2005	90
2004	65
2003	90
2001	70
2000	39
1999	90
Average	68

Similarly, the ten-year average allocation of Friant Division CVP water supplies delivered to AEWS D is described in Table 2. It lists maximum deliveries of CVP water on a yearly basis from 2000 to 2010. The ten-year average is 97 percent Class 1 and 23 percent Class 2 of contract amounts. The annual contract entitlement for AEWS D is 40,000 af Class 1 and 311,675 af Class 2, thus the ten-year average supply is 38,800 af Class 1 and 72,309 af Class 2 (total = 111,109 af). AEWS D's 2009 Friant Division allocated water supply is currently estimated to be 40,000 af Class 1 and 46,751 af of Class 2 (both estimated) for a total of 83,751 af which is only slightly less than their norm.

**Table 2 Average Friant Allocation
(as Percentage of Contract Amounts)**

Contract Year	Allocation (%)	
	Class 1	Class 2
09 – 10	100*	15*
08 – 09	100	5
07 – 08	70	0
06 – 07	100	31
05 – 06	100	58
04 – 05	100	26
03 – 04	100	30
02 – 03	100	9
01 – 02	100	6
00 – 01	100	52
Average	97	23

* Preliminary allocations that are estimated deliveries due to current “Uncontrolled Season”

Refined allocation determinations are likely to be made throughout the contract year to align the allocation with the hydrologic conditions and pumping capabilities.

Friant Division Contract Definitions

According to AEWS’s long-term renewal contract (as well as all of the Friant Division contracts) Class 2 Water means “that supply of water which can be made available subject to the contingencies described” in the contract “for delivery from Millerton Lake and the Friant-Kern and Madera Canals in addition to the supply of Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water will be undependable in character and will be furnished only if, as, and when it can be made available as determined by the Contracting Officer;” The maximum amount of Class 2 water contracted for in the Friant Division is 1,401,475

Additionally, AEWS’s long-term renewal contract describes “Uncontrolled Season” as any time during the year the Contracting Officer determines that a need exists to evacuate water from Millerton Lake in order to prevent or minimize spill or to meet flood control criteria, taking into consideration, among other things, anticipated upstream reservoir operations and the most probable forecast of snowmelt and runoff projections for the upper San Joaquin River.”

Arvin Edison Water Storage District

AEWSD's current facilities were primarily constructed in the 1960s and are based on the conjunctive use of surface water imported from the CVP, Friant Division, and groundwater resources that underlie most of AEWSD (see Figure 1 for a map of AEWSD Facilities). AEWSD owns groundwater wells that it uses to supply groundwater to farms within its service area when surface water supplies are deficient. Recharging and then pumping groundwater adds costs to water deliveries related to power for pumping and operation and maintenance of recharge facilities. To meet the needs of its customers, AEWSD tries to maximize the value of water delivered by providing water at the least cost to growers.

Water supplies in California vary from abundant supplies during wet periods to extreme shortages during droughts. To regulate this variability in its supplies, AEWSD utilizes its groundwater and also has exchanged a portion of its stored wet-year supplies for dry-year water available from other San Joaquin valley water districts.

AEWSD has historically made available a portion of its Friant-Kern CVP water supply to other CVP contractors located on the eastside of the San Joaquin Valley in exchange for their water available from the CVP northern California water supplies that was diverted into and through the Aqueduct. Due to a decrease in supply reliability and dramatic cost increases, certain of these exchanges are no longer feasible, as a consequence, it has been necessary for AEWSD to identify and implement other measures in order to manage its highly variable CVP water supplies.

By delivering water to groundwater storage when available it is possible to decrease the effects of natural and regulated variability in supplies. Critical elements in improving reliability and operational flexibility are storage and conveyance facilities. These critical elements especially when used in conjunctive-use programs, allow water managers to increase the beneficial use of existing supplies in an environmentally sound manner.

Metropolitan Water District of Southern California

MWD was created in 1928 under an enabling act of the California State Legislature to provide supplemental water to cities and counties in the Southern California coastal plain. This supplemental water is delivered to MWD's twenty six member agencies through a regional network of canals, pipelines, reservoirs, treatment plants and related facilities.

In the late 1990's, MWD developed an Integrated Resources Plan (IRP) which predicted significant water supply deficits for its service area and also outline the efforts needed on several fronts to avoid significant water shortages, especially in dry years. This plan

called for a mix of water resources derived from conservation, reclamation, groundwater conjunctive-use and water transfers to ensure adequate system flexibility to protect public safety, particularly during droughts. The IRP specifically cites a need for diversification of MWD's source of supply including accessing transfers, exchanges and groundwater banking programs involving Central Valley water districts.

MWD uses a variety of water supplies to meet the municipal and industrial water demands of its customers. The SWP, previously discussed as being 533,400 af below the typical supply levels, being one source. All sources are under pressure due to environmental restrictions and continuing demands.

AEWSD/MWD Groundwater Banking Program

Under the Program, AEWSD agreed that MWD would be able to deliver a minimum of 277,778 af to AEWSD (which equates to 250,000 af of banked water after a 10 percent loss factor is applied). It was also anticipated that MWD would cycle water through the Program and that, at AEWSD's discretion, MWD could store as much as 388,889 af at any one time in AEWSD's groundwater bank (which equates to 350,000 af of banked water after a 10 percent loss factor is applied). In order to facilitate this Program, AEWSD has constructed facilities worth nearly \$25 million, including 500 acres of new spreading works, 15 new groundwater wells, and a 4.5 mile bi-directional pipeline connecting the terminus of AEWSD's South Canal with the Aqueduct. These new facilities can be used in conjunction with existing AEWSD facilities.

Since 1997, MWD has delivered approximately 322,000 af of its SWP water supplies to AEWSD. Of this amount, approximately 290,000 af were stored in the groundwater basin underlying AEWSD on MWD's behalf after a 10 percent loss factor was applied. To date, AEWSD has returned approximately 159,000 af to MWD, resulting in a remaining balance of approximately 131,000 af. MWD's supplies were primarily conveyed to AEWSD via the Aqueduct, the Cross Valley Canal (CVC), AEWSD's Intake Canal, Forrest Frick Pumping Plant, and AEWSD's North and South Canals. In addition, limited amounts of MWD's SWP water have been delivered to AEWSD using the more cost effective AEWSD Intertie Pipeline (IPL). However, deliveries through the IPL are currently limited by the capacity of AEWSD's South Canal, daily deliveries to growers along that system, and well field recovery capacity. AEWSD has previously returned MWD's banked water to MWD by a combination of SWP water exchanges and by extracting banked groundwater and delivering it directly to the Aqueduct through the IPL (see Figure 1 for a map of AEWSD Facilities).

The Program has operated successfully for nearly 13 years resulting in benefits for both AEWS and MWD. For AEWS, the Program has generated revenue for new infrastructure to manage its water supplies, increased groundwater levels, and increased drought year supplies. In addition, improved conjunctive use operations and in-lieu banking have also allowed AEWS's farmers to utilize surface supplies instead of groundwater supplies at times when MWD banks water. For MWD, the Program has provided an opportunity to convert its surplus wet year SWP supplies into a firm dry year supply and to improve water quality in the Aqueduct when AEWS returns high quality groundwater to MWD. AEWS has benefited from enhanced recharge capabilities resulting from the facilities that were constructed as part of the Program as well as from higher groundwater levels resulting in lesser overall groundwater pumping energy use and costs. Appendix B has an accounting of the water placement and extractions associated with the Program.

A key underlying principle of the existing Program is that it will not adversely affect AEWS landowners. The two Program components in place to avoid adverse impacts are 1) a Groundwater Monitoring Program (GMP) and 2) a Groundwater Operating Criteria (Groundwater Rule). Regular information from the GMP is evaluated through the Ground Water Rule to determine the safe deliverable volumes available to MWD through the Program. Important variables to the Groundwater Rule are the Friant Division CVP surface water supplies available to AEWS, the recent series of hydrologic years, and the amount of water MWD has in storage. Further, the Program allows for the regular evaluation of the Groundwater Rule through modeling and measurements so as to make adjustments accordingly.

In early 2003, tie-in work for the new Lake Mathews outlet tower required the old tower and head works to be shut down for nearly ten weeks. During this winter shutdown period, MWD was unable to receive Colorado River supplies at some of its water treatment plants and the TOC levels in MWD's available SWP supplies had the potential to exceed the EPA average annual treatment requirements for treatment facilities. Subsequently MWD contacted AEWS for a winter delivery of stored groundwater with relatively low TOC levels. The delivery of this groundwater significantly reduced the treatment load on the treatment plants. The results of this effort was then investigated and analyzed in October 2003 in "Water Management Case Study, Lake Mathews Outage 2003" by MWD staff.

No CVP water has been delivered to MWD to date under the Program. All deliveries to date have been previously banked SWP supplies.

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative Reclamation would not approve the proposed exchange. Without the proposed exchange, AEWS D would deliver MWD an equivalent amount of pumped groundwater from MWD's banked supply within AEWS D as specified in the existing Program. AEWS D would retain their Friant Division supplies and these supplies would be used for internal district purposes which would likely be delivery to farmers or groundwater recharge.

Proposed Action

Under the Proposed Action AEWS D would deliver some of their CVP Friant water to MWD in lieu of AEWS D pumping groundwater. As a consequence, the groundwater that otherwise would have been pumped would be exchanged in its ownership from being MWD's to AEWS D's. This will save AEWS D/MWD the energy and cost associated with otherwise pumping and returning groundwater. Since AEWS D may also be directly recharging water to their groundwater at this time on their own behalf, it would also save AEWS D the expenses associated with operating their recharge basins.

The proposed "bucket-for-bucket" exchange primarily results in less energy use with virtually no changes in flow path.

Under the Proposed Action AEWS D would have sufficient water supplies to meet their water demands. CVP supplies made available for delivery to MWD would be surplus to AEWS D's immediate operational needs. This could be due to unanticipated short term allocations such as the declaration of "uncontrolled season" where Class 2 Friant Division CVP water is available in large amounts for a limited amount of time to all Class 2 contractors. Declarations such as this can provide the water needed for the exchange or be used to meet AEWS D's immediate irrigation demand freeing up schedulable water supplies for exchange.

The exchange would occur entirely within existing AEWS D conveyance facilities. During uncontrolled season, AEWS D imports all the water their system is capable of transporting; consequently, the exchange would not allow AEWS D to make use of more CVP water than they have the capacity to divert and recharge, such as the CVP water available during an uncontrolled season.

Alternatively, if the water is exchanged outside of a uncontrolled season, AEWS D may have to pump out a like amount of groundwater that was moved to MWD as surface water; however, AEWS D would have the opportunity to choose the most economic

power purchase periods. Also, by having some surface water to move at higher flow rates than available from pumping the well field AEWS D would have more flexibility to maximize the use of AEWS D's Intertie pumping plants and Aqueduct turnout when capacity is present.

MWD will receive the same amount of water through the same existing conveyance facilities as in the Program. There is no change with regard to the No Action for MWD. The Proposed Action has no affect on water supplies in MWD.

CVP and SWP facilities would not be impacted as the exchanged water must be scheduled and approved by Reclamation and DWR. As in the No Action Alternative, no natural streams or water courses would be affected since no additional pumping or diversion would occur. There would be no impact to water resources due to the Proposed Action.

Climate Change Climate change refers to changes in the global or a regional climate over time. Global climate change is expected to have some effect on the snow pack of the Sierra Nevadas and the run off regime. Current data are not yet clear on the hydrologic changes and how they will affect the SJV. Water allocations are made dependent on hydrologic conditions and environmental requirements. Since Reclamation operations and allocations are flexible, any changes in hydrologic conditions due to global climate change would be addressed within Reclamation's operation flexibility and therefore surface water resource changes due to climate change would be the same with or without the Proposed Action.

3.2 Land Use

3.2.1 Affected Environment

Metropolitan's Service Area

The Southern California Association of Governments area comprises the bulk of MWD's service area both in terms of area and water usage. Only 10 percent of the region is urbanized. The remainder is largely uninhabited mountain and desert area, rich in natural resources. The area is home to approximately 15 million people with the expectation to reach a population of 22 million people by the year 2015.

Principal land use trends include densification of existing residential and commercial areas, urban fill on scattered pockets of vacant land, extension of urban development into hillside and mountainous terrain and suburban expansion on the perimeter of the urbanized regions with new planned developments. Such trends are operating differently

in various sub regions, depending upon their respective histories, locations and socio-economic influences. City and county regional plans reflect mainly incremental changes to existing land use in coastal areas, while major expansions of the new urban development are shown for undeveloped land in outlying valleys and desert areas.

Arvin Edison's Service Area

Arvin-Edison includes the City of Arvin and is located in the proximity of the unincorporated communities of Edison, Lamont, Mettler, and DiGiorgio. The vast majority of farmland in the Arvin-Edison service area is classified as Irrigated Farmland by the California Department of Conservation. The second main farmland classification in the service area is Non-irrigated Farmland

Agriculture, in the form of row crops, orchards and vineyards, is the primary land use in the region. The Kern County General Plan designates most areas within the Arvin-Edison service area as "intensive agriculture." Supplemental irrigation is required for these activities as the area receives an average of only 8.5 inches of rainfall per year. Other agricultural uses, while not directly dependent on irrigation for production, are also consistent with the intensive agriculture designation. The minimum parcel size is 20 acres and permitted uses include, but are not limited to, irrigated cropland, orchards, vineyards, horse ranches, beekeeping, ranch and farm facilities, and related uses. One single-family dwelling unit is permitted per 20-acre parcel.

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, AEWS D would deliver MWD's banked SWP supplies in the form of pumped groundwater back to them. Therefore, no new development associated with adopting the No Action Alternative would occur.

Proposed Action

AEWS D would allow up to 80,000 af (up to 40,000 af/y) of its 2009 CY and/or 2010 CY Class 1 or Class 2 Friant Division CVP supplies to be delivered to MWD. The exchanged CVP water would be delivered from Millerton Lake Reservoir at existing diversion points at Friant Dam into the FKC. The water would then be transported through the FKC to MP151.80, the AEWS D turnout. No other CVP facilities would be utilized in the delivery of the exchanged water. The exchange would be a "bucket for bucket" exchange. MWD would exchange an equivalent amount of banked groundwater in the Program for the delivered CVP supplies. The SWP water so exchanged would reside in AEWS D's groundwater reservoir for ultimate delivery by AEWS D for agricultural purposes. At a time of its choosing, AEWS D would use its groundwater wells to recover the banked water and deliver it to landowners. The proposed exchange

primarily results in less energy use with virtually no changes in flow path. The water exchange would, therefore, not include additional population growth in Southern California nor would it have any other cumulative effects

The Proposed Action would generate no new housing and would result in no new permanent population growth that would exceed official regional or local population projections in the AEWS's or MWD's service area. No new agricultural development is expected under the Proposed Action.

3.3 Biological Resources

3.3.1 Affected Environment

The indigenous habitat types in the southern San Joaquin Valley are grassland, alkaline sink, and shrub land. Coupled with the infrequency of freezing temperatures, the moist winters allow growth of herbaceous, annual vegetation and small, woody shrubs despite the area's overall aridity. The open vegetation cover provides seed and insect forage yet is sparse enough to allow good visibility of approaching predators. Consequently, the dominant animals are burrowing rodents, which are water-conserving, and may be inactive or dormant during the hottest and/or coldest periods of the year or when food supplies are scarce. Reptiles also use the rodent burrows. Predators attracted by the rodent and reptile populations include raptors, gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*).

Grasslands occur on the hill slopes above agricultural plain and in a few cultivated patches in the valley. The grasses are primarily red brome and annuals such as lupines (*Lupinus* spp.), blue dicks (*Dichelostemma capitatum*), and California poppy (*Eschscholzia californica*) in the spring. Western meadowlark (*Sturnella neglecta*), mourning dove (*Zerlaidura macroura*), and sparrows are common birds in the grasslands. Raptors will often be seen foraging over these grasslands for small rodents such as western harvest mice (*Reithrodontomys megalotis*) or Heermann's kangaroo rats (*Dipodomys heermanni*).

Grazing occurs in some areas of the valley floor and on the surrounding hillsides. Pasture lands consist primarily of alfalfa with some annual grasses. Wildlife values are similar to those described previously for grasslands. Rows or small groves of non-native tamarisks (*Tamarix tetrandia*) and eucalyptus trees (*Eucalyptus* spp.) have been planted in a few locations to provide shade and wind breaks or to control overflow waters. As the only over story in the area, these trees provide roosting sites for several bird species, including

house finches (*Carpodacus mexicanus*), song sparrows (*Melospiza melodia*), and lesser goldfinches (*Carduelis psaltria*).

Valley scrub is a similar shrub land community that generally occurs on saline or alkaline soils. It is often found on shallow interior floodplains or playas where seasonal flooding is followed by a dry, hot summer. Dominant plants include iodine bush (*Allenrolfea occidentalis*), red brome (*Bromis rubens*), and saltgrass (*Distichlis spicata* var. *stricta*). Wildlife species are similar to those described above for valley saltbush scrub.

Plants within AEWS

Most of the land within the AEWS service area is devoted to irrigated agricultural production. Because the irrigated fields are intensively managed, very little to no native vegetation exists, and little volunteer vegetation is allowed to grow. Cultivation often occurs up to the very margins of fields, roads, or ditches. Herbicides are routinely used to control unwanted vegetation which typically includes all non-crop species. Occasionally, cultivated land is allowed to lie fallow, and ruderal plant associations take over. Ruderal habitats are subject to frequent disturbance and are quickly colonized by non-native, and to a lesser extent native, plant species. Species composition varies greatly depending on the location, type, and frequency of disturbance and proximity of natural habitats. In addition to fallow agricultural fields, roadsides within the southern San Joaquin Valley area often support ruderal plant communities. Row crops and orchards provide minimal food and cover for wildlife.

Small areas within the AEWS service area contain remnants of several indigenous plant communities, including valley saltbush scrub, valley sink scrub, and grasslands. Their limited extent is primarily due to conversion to agriculture, although mining and off-road vehicle use have also reduced the extent of native vegetation.

Valley saltbush scrub contains widely spaced, low shrubs that are tolerant to long, hot and dry summers. In the AEWS service area, saltbush of the genus *Atriplex* are the most conspicuous plants of this vegetative community. Western jimson weed (*Datura mereloides*), tree tobacco (*Nicotiana glauca*), bush buckwheat (*Eriogonum fasciculatum*), deerweed (*Lotus scoparius*), and locoweed (*Astragalus* spp.) are also common.

Wildlife

Wildlife typically found in the saltbush scrub community include black-tailed jackrabbit, California ground squirrel, coyote, side-blotched lizard (*Uta stansburiana*), red-shouldered hawk (*Buteo lineatus*), turkey vulture (*Cathartes aura*), greater roadrunner (*Geococcyx californicus*), and savanna sparrow (*Passerculus sandwichensis*).

Some bird species such as the yellow-billed magpie (*Pica nuttallif*), common crow (*Corvus brachyrhynchus*), Brewer's blackbird (*Euphagus cyanocephalus*), and American kestrel (*Falco sparverius*) may use the trees for perching and nesting. Grain crops provide food and nesting sites for waterfowl, ring-necked pheasants (*Phasianus colchicus*), California quail (*Callipepla californicus*), short-eared owl (*Asio flammeus* sp.), and various small mammals.

Black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus bachmanni*), valley pocket gopher (*Thomomys umbrinus*) and California ground squirrel (*Spermophilus beecheyi*) may be present, especially on ditch-side berms surrounding fields.

Special-Status Species

With the conversion of much of the valley floor to agriculture, suitable habitat for special-status species is scarce, and these species are becoming less common. Other reasons for their decline include sand mining operations, use of rodenticides, and off-road vehicle use. Few natural botanical resources are present within the AEWS service area because they are located in active agricultural lands and other frequently disturbed areas.

A number of plant species that are listed as federally or state-threatened or endangered potentially occur in the general AEWS area. These are Bakersfield smallscale (*Atriplex tularensis*), California jewelflower (*Caulanthus californicus*), Hoover's eriastrum (*Eriastrum hooveri*), and San Joaquin woolly threads (*Lembertia congdonii*).

Seven species of animals that have some federally protected status or are listed by California as endangered, threatened, or species of concern potentially occur in the general AEWS service area. These include blunt-nosed leopard lizard (*Gambelia sila*), San Joaquin coachwhip (*Masticophis flagellum ruddoch*), burrowing owl (*Xiphosurus cunicularia*), Tulare grasshopper mouse (*Onychomys torridus tularensis*), short-nosed kangaroo rat (*Dipodomys nitratoides brevinasus*), San Joaquin antelope squirrel (*Ammospermophilus nelson*), and the San Joaquin kit fox (*Vulpes macrotis mutica*).

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, there would be no impacts to biological resources since conditions would remain the same as existing conditions.

Proposed Action

Effects are similar to the No Action Alternative. Most of the habitat types required by species protected by the Endangered Species Act (ESA) do not occur in the project area. The Proposed Action would not involve the conversion of any land fallowed and untilled for three or more years. The Proposed Action also would not change the land use patterns of the cultivated or fallowed fields that do have some value to listed species or birds protected by the Migratory Bird Treaty Act (MBTA). Since no natural stream courses or additional pumping would occur, there would be no effects on listed fish species. No critical habitat occurs within the area affected by the Proposed Action and so none of the primary constituent elements of any critical habitat would be affected.

3.4 Cultural Resources

3.4.1 Affected Environment

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act (NHPA) of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the NHPA requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP). Those resources that are on or eligible for inclusion in the National Register are referred to as historic properties. The Section 106 process is outlined in the Federal regulations at 36 Code of Federal Regulations (CFR) Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects (APE), determine if historic properties are present within that APE, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office (SHPO), to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

The San Joaquin Valley is rich in historical and prehistoric cultural resources. Cultural resources in this area are generally prehistoric in nature and include remnants of native human populations that existed before European settlement. Prior to the 18th Century,

many Native American tribes inhabited the Central Valley. It is possible that many cultural resources lie undiscovered across the valley. The San Joaquin Valley supported extensive populations of Native Americans, principally the Northern Valley Yokuts, in the prehistoric period. Cultural studies in the San Joaquin Valley have been limited. The conversion of land and intensive farming practices over the last century has probably destroyed many Native American cultural sites.

The conveyance features that will be utilized to complete the water transfer are currently used by both AEWS and MWD for water conveyance and exchange. These conveyance facilities include the California Aqueduct, the Cross Valley Canal, the Forrest Frick Pumping Plant, and AEWS's North and South Canals. AEWS's current facilities were primarily constructed in the 1960s, although in recent years AEWS has constructed new wells, and a 4.5 mile bi-directional pipeline that connects South Canal with the California Aqueduct.

3.4.2 Environmental Consequences

No Action

Under the No Action Alternative, there are no impacts to cultural resources since there would be no ground disturbance. Conditions related to cultural resources would remain the same as existing conditions.

Proposed Action

The exchange of water between AEWS and MWD, as described in the Proposed Action, is the type of activity that has no potential to affect historic properties. There will be no new ground disturbance and the exchange will be accomplished using existing facilities. These lands are agricultural lands that have undergone cultivation and land disturbance for more than 20 years. Because the action will result in no potential to affect historic properties, there will be no impacts to cultural resources as a result of the implementation of the Proposed Action.

3.5 Indian Trust Assets

3.5.1 Affected Environment

Indian trust assets (ITAs) are legal interests in assets that are held in trust by the United States Government for federally recognized Indian tribes or individual Indians. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. "Assets" are anything owned that holds monetary value. "Legal interests" means there is a property interest for which there is a legal remedy, such as compensation or injunction, if there is improper interference. Assets can be real property,

physical assets, or intangible property rights, such as a lease, or right to use something. ITAs cannot be sold, leased or otherwise alienated without United States' approval. ITAs may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. Indian reservations, rancherias, and public domain allotments are examples of lands that are often considered trust assets. In some cases, ITAs may be located off trust land.

Reclamation shares the Indian trust responsibility with all other agencies of the Executive Branch to protect and maintain ITAs reserved by Indian tribes, or individual Indians by treaty, statute, or Executive Order.

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative there are no impacts to ITAs, since conditions would remain the same as existing conditions.

Proposed Action

There are no tribes possessing legal property interests held in trust by the United States in the water involved with this action, nor is there such a property interest in the lands designated to receive the water proposed in this action.

There are no ITAs, Indian Reservations, or public domain allotments found within the water districts involved. The Proposed Action would not affect or interfere with the observation of religious or other ceremonies associated with ITAs.

3.6 Socioeconomic Resources

3.6.1 Affected Environment

The agricultural industry significantly contributes to the overall economic stability of the San Joaquin Valley. The CVP allocations each year allow farmers to plan for the types of crops to grow and to secure loans to purchase supplies. Depending upon the variable hydrological and economical conditions, water transfers and exchanges could be prompted. The economic variances may include fluctuating agricultural prices, insect infestation, changing hydrologic conditions, increased fuel and power costs.

3.6.2 Environmental Consequences

No Action

Under the No Action Alternative economic conditions in the vicinity of AEWS D would remain the same. Economic impacts of the proposed exchange would not affect agricultural production or the community.

Proposed Action

The proposed exchange primarily results in less energy use with virtually no changes in flow path. This would save AEWS D/MWD the energy and cost associated with otherwise pumping and returning groundwater. If AEWS D is also directly recharging water to their groundwater at this time on their own behalf, it would also save AEWS D the expenses associated with operating their recharge basins. The proposed exchanges would not interfere with SWP or CVP priorities or operations and would result in temporarily increased water supply reliability.

3.7 Environmental Justice

3.7.1 Affected Environment

Executive Order 12898, dated February 11, 1994, requires Federal agencies to ensure that their actions do not disproportionately impact minority and disadvantaged populations.

The market for seasonal workers on local farms draws thousands of migrant workers, commonly of Hispanic origin from Mexico and Central America. .

3.7.2 Environmental Consequences

No Action

The No Action Alternative would not result in harm to minority or disadvantaged populations within the vicinity of AEWS D and MWD; however, implementation of the Proposed Action would ensure the viability of water supplies to meet summertime peaking demands, therefore, ensuring the viability of farm labor jobs.

Proposed Action

The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease. The Proposed Action would not disproportionately impact economically disadvantaged or minority populations. This proposed exchange is intended to allow the expeditious water delivery of surface water supplies available to AEWS D in lieu of groundwater it otherwise would have extracted and delivered to MWD in fulfilling its return water obligations to MWD under their Program of water banking this year and potentially next year. Water so delivered would primarily serve to reduce energy use

with attendant cost savings and would also allow MWD greater instantaneous access to water supplies to meet summertime peaking demands, therefore securing agricultural jobs in the region. The unemployment rate in the vicinity of AEWS and MWD suggests that any actions that maintain seasonal jobs should be considered beneficial. Disadvantaged populations would not be subject to disproportionate impacts.

3.8 Cumulative Impacts

AEWS is proposing to exchange and deliver some of their own CVP Friant water to MWD in lieu of AEWS pumping the previously delivered SWP water that is banked in the underground. As a consequence, the groundwater that otherwise would have been pumped would be exchanged in its ownership from being MWD's to AEWS's. This would save AEWS the energy and cost associated with otherwise pumping and returning groundwater. Since AEWS may also be directly recharging water to their groundwater at this time on their own behalf, it would also save AEWS the expenses associated with operating their recharge basins.

The proposed “bucket-for-bucket” exchange primarily results in less energy use with virtually no changes in flow path. Without this exchange, AEWS would deliver MWD an equivalent amount of pumped groundwater from MWD’s banked supply within AEWS.

The proposed exchange when added to other actions do not contribute to significant increases or decreases in environmental conditions. These water service actions are proposed to occur only within the timeframe specified for the consolidation for the CVP and SWP places of use, from approximately June 1, 2009 through May 31, 2010 and are not precedent setting. The Proposed Action was found to have no impact on water resources, biological resources, cultural resources, ITAs, and socioeconomics and therefore there is no contribution to cumulative impacts on these resources areas. Slight beneficial impacts to land use and environmental justice are within the historical variations and would not contribute to cumulative impacts. Overall there would be no cumulative impacts caused by the Proposed Action.

Section 4 Consultation and Coordination

4.1 Fish and Wildlife Coordination Act (16 USC § 651 et seq.)

The Fish and Wildlife Coordination Act (FWCA) requires that Reclamation consult with fish and wildlife agencies (federal and state) on all water development projects that could

affect biological resources. The implementation of the Central Valley Project Improvement Act, of which this action is a part, has been jointly analyzed by Reclamation and the United States Fish and Wildlife Service and is being jointly implemented. Since there would be no ground disturbance and water would move in existing facilities the FWCA does not apply.

4.2 Endangered Species Act (16 USC §1521 et seq.)

Section 7 of the ESA requires Federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. Since there would be no ground disturbance and water would move in existing facilities there would be no effect on endangered species. The 2001 Biological Opinion on U.S. Bureau of Reclamation Long Term Contract Renewal of Friant Division and Cross Valley Unit Contracts requires Reclamation to consult with the Sacramento Field Office of the USFWS on this type of action, regardless of the effect determination. Therefore, Reclamation will be informally consulting with the USFWS on the Proposed Action.

4.3 National Historic Preservation Act (15 USC § 470 et seq.)

The NHPA of 1966, as amended (16 USC 470 et seq), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the National Register of Historic Places. The 36 CFR Part 800 regulations implement Section 106 of the NHPA.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the National Register. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the area of potential effect (APE), conduct cultural resource inventories, determine if historic properties are present within the APE, and assess effects on any identified historic properties. The activities associated with implementing the water exchange described in the Proposed Action will include no new ground disturbance, no change in land use, and the use of existing conveyance facilities to move the exchanged water. Reclamation has determined that there is no potential to affect historic properties by the proposed action pursuant to 36 CFR 800.3(a)(1).

4.4 Migratory Bird Treaty Act (16 USC § 703 et seq.)

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the MBTA provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the MBTA, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, part, nest or egg will be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

The Proposed Action would not affect birds protected under the MBTA because no new facilities will be built and no growth will occur due to the project.

4.5 Executive Order 11988 – Floodplain Management and Executive Order 11990-Protection of Wetlands

Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains. Executive Order 11990 places similar requirements for actions in wetlands. The Proposed Action would not affect either concern.

Section 5 List of Preparers and Reviewers

Reclamation Preparers and Reviewers

Judi Tapia – Supervising Natural Resource Specialist

Barbara Hidleburg, Repayment Specialist – reviewer

Provost and Prichard Engineering preparers include:

- Richard M. Moss, P.E.
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AEWSD prepares include:

- Steven C. Collup, P.E., Engineer Manager
- Jeevan Muhar, P.E., Staff Engineer

Section 6 References

FWS, 2008 http://www.fws.gov/sacramento/es/spp_lists/auto_list_form.cfm accessed [June 17](#), 2008. Site last updated January 31, 2008

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Appendix A

Arvin-Edison/Metropolitan Water Management Program

Summary of Water Deliveries

ARVIN-EDISON / METROPOLITAN WATER MANAGEMENT PROGRAM SUMMARY OF WATER DELIVERIES - AF

Water Year	Month	SWP Water Delivered to AE				Regulated Water	Returned to MWD	Program Balance	
		CVC		Intertie Pipeline	Total Monthly			Monthly	Accum.
		Tupman	To AE						
1997	Dec	1,486	1,480	0	1,480	1,332	0	1,332	1,332
	Jan	10,973	10,933	0	10,933	9,840	0	9,840	11,172
	Feb	336	331	0	331	298	0	298	11,470
1998	Mar	0	0	0	0	0	0	0	11,470
	Apr	0	0	0	0	0	0	0	11,470
	May	0	0	0	0	0	0	0	11,470
	Jun	0	0	0	0	0	0	0	11,470
	Jul	0	0	0	0	0	0	0	11,470
	Aug	759	738	0	738	664	0	664	12,134
	Sep	7,019	6,829	0	6,829	6,146	0	6,146	18,280
	Oct	6,612	6,541	0	6,541	5,887	0	5,887	24,167
	Nov	4,035	4,035	0	4,035	3,632	0	3,632	27,798
	Dec	0	0	0	0	0	0	0	27,798
	Jan	0	0	0	0	0	0	0	27,798
	Feb	0	0	0	0	0	0	0	27,798
1999	Mar	8,041	7,950	0	7,950	7,155	0	7,155	34,953
	Apr	15,916	15,838	0	15,838	14,254	0	14,254	49,208
	May	21,579	21,527	0	21,527	19,374	0	19,374	68,582
	Jun	19,319	19,276	0	19,276	17,348	0	17,348	85,930
	Jul	10,697	10,697	0	10,697	9,627	0	9,627	95,558
	Aug	7,854	7,854	0	7,854	7,069	0	7,069	102,626
	Sep	2,958	2,947	0	2,947	2,652	0	2,652	105,278
	Oct	137	137	0	137	123	0	123	105,402
	Nov	4,292	4,267	0	4,267	3,840	0	3,840	109,242
	Dec	4,369	4,297	0	4,297	3,867	0	3,867	113,109
	Jan	12,049	11,985	0	11,985	10,787	0	10,787	123,896
	Feb	4,475	4,452	0	4,452	4,007	0	4,007	127,903
2000	Mar	0	0	0	0	0	0	0	127,903
	Apr	10,801	10,719	0	10,719	9,647	0	9,647	137,550
	May	0	0	0	0	0	0	0	137,550
	Jun	21,130	20,930	0	20,930	18,837	0	18,837	156,387
	Jul	24,803	24,686	0	24,686	22,217	0	22,217	178,604
	Aug	16,675	16,587	0	16,587	14,928	0	14,928	193,532
	Sep	17,166	17,075	0	17,075	15,368	0	15,368	208,900
	Oct	21,119	21,015	0	21,015	18,914	0	18,914	227,813
	Nov	15,752	15,661	0	15,661	14,095	0	14,095	241,908
	Dec	5,761	5,716	0	5,716	5,144	0	5,144	247,053
	Jan	0	0	0	0	0	0	0	247,053
	Feb	0	0	0	0	0	0	0	247,053

ARVIN-EDISON / METROPOLITAN WATER MANAGEMENT PROGRAM
SUMMARY OF WATER DELIVERIES - AF

Water Year	Month	SWP Water Delivered to AE				Regulated Water	Returned to MWD	Program Balance	
		CVC		Intertie Pipeline	Total Monthly				
		Tupman	To AE						
2001	Mar	0	0	0	0	0	0	0	247,053
	Apr	0	0	0	0	0	0	0	247,053
	May	0	0	0	0	0	0	0	247,053
	Jun	0	0	0	0	0	0	0	247,053
	Jul	0	0	0	0	0	0	0	247,053
	Aug	0	0	0	0	0	0	0	247,053
	Sep	0	0	0	0	0	5,000	-5,000	242,053
	Oct	0	0	0	0	0	5,800	-5,800	236,253
	Nov	0	0	0	0	0	5,000	-5,000	231,253
	Dec	0	0	0	0	0	5,000	-5,000	226,253
	Jan	0	0	0	0	0	0	0	226,253
	Feb	0	0	0	0	0	0	0	226,253
2002	Mar	0	0	0	0	0	0	0	226,253
	Apr	0	0	0	0	0	0	0	226,253
	May	0	0	0	0	0	0	0	226,253
	Jun	0	0	0	0	0	0	0	226,253
	Jul	0	0	0	0	0	0	0	226,253
	Aug	0	0	0	0	0	0	0	226,253
	Sep	0	0	0	0	0	0	0	226,253
	Oct	0	0	0	0	0	0	0	226,253
	Nov	0	0	0	0	0	0	0	226,253
	Dec	0	0	0	0	0	0	0	226,253
	Jan	0	0	0	0	0	5,795	-5,795	220,458
	Feb	0	0	0	0	0	5,688	-5,688	214,770
2003	Mar	0	0	0	0	0	897	-897	213,873
	Apr	0	0	0	0	0	0	0	213,873
	May	4,727	4,722	750	5,472	4,925	0	4,925	218,798
	Jun	11,255	11,199	2,735	13,934	12,541	0	12,541	231,338
	Jul	8,038	8,000	3,761	11,761	10,585	0	10,585	241,923
	Aug	0	0	1,900	1,900	1,710	0	1,710	243,633
	Sep	0	0	1,400	1,400	1,260	0	1,260	244,893
	Oct	0	0	1,520	1,520	1,368	0	1,368	246,261
	Nov	0	0	675	675	608	0	608	246,869
	Dec	3,700	3,677	170	3,847	3,462	0	3,462	250,331
	Jan	0	0	0	0	0	0	0	250,331
	Feb	0	0	0	0	0	0	0	250,331

ARVIN-EDISON / METROPOLITAN WATER MANAGEMENT PROGRAM
SUMMARY OF WATER DELIVERIES - AF

Water Year	Month	SWP Water Delivered to AE				Regulated Water	Returned to MWD	Program Balance	
		CVC		Intertie Pipeline	Total Monthly				
		Tupman	To AE						
2004	Mar	0	0	0	0	0	0	0	250,331
	Apr	0	0	0	0	0	0	0	250,331
	May	0	0	0	0	0	0	0	250,331
	Jun	0	0	0	0	0	1,664	-1,664	248,667
	Jul	0	0	0	0	0	1,982	-1,982	246,685
	Aug	0	0	0	0	0	2,829	-2,829	243,856
	Sep	0	0	0	0	0	11,630	-11,630	232,226
	Oct	0	0	0	0	0	13,625	-13,625	218,601
	Nov	0	0	0	0	0	6,858	-6,858	211,743
	Dec	0	0	0	0	0	4,689	-4,689	207,054
	Jan	0	0	0	0	0	0	0	207,054
	Feb	0	0	0	0	0	0	0	207,054
2005	Mar	0	0	0	0	0	0	0	207,054
	Apr	0	0	0	0	0	0	0	207,054
	May	0	0	0	0	0	0	0	207,054
	Jun	0	0	0	0	0	0	0	207,054
	Jul	0	0	0	0	0	0	0	207,054
	Aug	0	0	0	0	0	0	0	207,054
	Sep	0	0	0	0	0	0	0	207,054
	Oct	0	0	0	0	0	0	0	207,054
	Nov	0	0	0	0	0	0	0	207,054
	Dec	0	0	0	0	0	0	0	207,054
	Jan	0	0	0	0	0	0	0	207,054
	Feb	0	0	0	0	0	0	0	207,054
2006	Mar	0	0	0	0	0	0	0	207,054
	Apr	0	0	0	0	0	0	0	207,054
	May	0	0	0	0	0	0	0	207,054
	Jun	0	0	0	0	0	0	0	207,054
	Jul	0	0	0	0	0	0	0	207,054
	Aug	0	0	1,259	1,259	1,133	0	1,133	208,187
	Sep	0	0	1,940	1,940	1,746	0	1,746	209,933
	Oct	0	0	946	946	851	0	851	210,784
	Nov	0	0	883	883	795	0	795	211,579
	Dec	0	0	412	412	371	0	371	211,950
	Jan	0	0	745	745	671	0	671	212,620
	Feb	0	0	1,136	1,136	1,022	0	1,022	213,643

ARVIN-EDISON / METROPOLITAN WATER MANAGEMENT PROGRAM
SUMMARY OF WATER DELIVERIES - AF

Water Year	Month	SWP Water Delivered to AE				Regulated Water	Returned to MWD	Program Balance	
		CVC		Intertie Pipeline	Total Monthly			Monthly	Accum.
		Tupman	To AE						
2007	Mar	0	0	0	0	0	2,540	-2,540	211,103
	Apr	0	0	0	0	0	1,254	-1,254	209,849
	May	0	0	0	0	0	598	-598	209,251
	Jun	0	0	0	0	0	485	-485	208,766
	Jul	0	0	0	0	0	500	-500	208,266
	Aug	0	0	0	0	0	701	-701	207,565
	Sep	0	0	0	0	0	1,531	-1,531	206,034
	Oct	0	0	0	0	0	5,092	-5,092	200,942
	Nov	0	0	0	0	0	5,893	-5,893	195,049
	Dec	0	0	0	0	0	5,631	-5,631	189,418
	Jan	0	0	0	0	0	8,715	-8,715	180,703
	Feb	0	0	0	0	0	5,758	-5,758	174,945
2008	Mar	0	0	0	0	0	4,710	-4,710	170,235
	Apr	0	0	0	0	0	1,054	-1,054	169,181
	May	0	0	0	0	0	604	-604	168,577
	Jun	0	0	0	0	0	783	-783	167,794
	Jul	0	0	0	0	0	979	-979	166,815
	Aug	0	0	0	0	0	1,577	-1,577	165,238
	Sep	0	0	0	0	0	1,819	-1,819	163,419
	Oct	0	0	0	0	0	3,102	-3,102	160,317
	Nov	0	0	0	0	0	5,956	-5,956	154,361
	Dec	0	0	0	0	0	2,545	-2,545	151,816
	Jan	0	0	0	0	0	9,331	-9,331	142,485
	Feb	0	0	0	0	0	7,869	-7,869	134,616
2009	Mar	0	0	0	0	0	3,528	-3,528	131,088
	Apr	0	0	0	0	0	0	0	131,088
	May	0	0	0	0	0	0	0	131,088
	Jun	0	0	0	0	0	0	0	131,088
	Jul	0	0	0	0	0	0	0	131,088
	Aug	0	0	0	0	0	0	0	131,088
	Sep	0	0	0	0	0	0	0	131,088
	Oct	0	0	0	0	0	0	0	131,088
	Nov	0	0	0	0	0	0	0	131,088
	Dec	0	0	0	0	0	0	0	131,088
	Jan	0	0	0	0	0	0	0	131,088
	Feb	0	0	0	0	0	0	0	131,088
Total		303,833	302,101	20,232	322,333	290,100	159,012	131,088	

MWD water-2.xls